What is claimed is:

Sub A1

1. A method for annealing lithium niobate ($LiNbO_3$) structures, the method comprising:

heating a lithium niobate structure in a sealed oxygen gas (O_2) atmosphere to a temperature within a range of about 150 degrees Celsius to about 1000 degrees Celsius;

pressurizing the sealed oxygen gas atmosphere to exceed ambient atmospheric pressure;

maintaining temperature and pressure for an anneal period; and

cooling to room temperature.

2. The method of claim 1 wherein said heating occurs at a rate within the range of about 0.5 degrees Celsius per minute to about 12.0 degrees per minute.

3. The method of claim 1 wherein said heating is within a temperature range of about 300 degrees Celsius to about 600 degrees Celsius.

4. The method of claim 1 wherein said heating is to a temperature of about 300 degrees Celsius.

5. The method of claim 1 wherein said pressurizing is within a pressure range of about 2 psi above ambient atmospheric pressure to about 25 psi above ambient atmospheric pressure.

6. The method of claim 1 wherein said pressurizing is to a pressure of about 6 psi above ambient atmospheric pressure.

7. The method of claim 1 wherein said cooling occurs within a ranges of rates of about 0.5 degrees Celsius per minute to about 40 degrees Celsius per minute.

8. The method of claim 1 wherein said cooling occurs at a rate of about 1.0 degrees Celsius per minute.

9. A method for annealing lithium niobate ($LiNbO_3$) structures, the method comprising:

heating a lithium niobate structure in a sealed oxygen gas (O_2) atmosphere to a temperature within a range of about 300 degrees Celsius to

about 400 degrees Celsius;

pressurizing the sealed oxygen gas atmosphere to a pressure within the range of about 2 psi above ambient atmospheric pressure to about 25 psi above ambient atmospheric pressure;

maintaining temperature and pressure for a minimum period of about 4 hours; and

cooling to room temperature.

10. The method of claim 9 wherein said heating occurs at a rate of about 1.0 degree Celsius per minute.

11. The method of claim 9 wherein said heating is to a temperature of 300 degrees Celsius.

12. The method of claim 9 wherein said pressurizing is to a pressure of about 6 psi above ambient atmospheric pressure.

13. The method of claim 9 wherein said cooling occurs within a range of rates of about 0.5 degrees Celsius per minute to about 40 degrees Celsius per minute.

14. A method for annealing an optical modulator, said method comprising:

heating a substrate comprising lithium niobate in an oxygen gas (O_2) atmosphere to a temperature within a range of about 150 degrees Celsius to about 1000 degrees Celsius;

pressurizing the oxygen gas atmosphere to exceed ambient atmospheric pressure;

maintaining temperature and pressure for an anneal period; and

cooling to room temperature.

15. The method of claim 14 wherein said method occurs after buffer layer deposition on the substrate comprising lithium niobate.

16. The method of claim 14 wherein said method occurs after electrode fabrication on the substrate comprising lithium niobate.

17. A method for annealing an optical waveguide, the method comprising:

heating a substrate comprising lithium niobate in a sealed oxygen gas (O_2) atmosphere to a temperature within the range of about 150 degrees Celsius to about 1000 degrees Celsius;

pressurizing the oxygen gas atmosphere to exceed ambient atmospheric pressure;

maintaining temperature and pressure for an anneal period; and

cooling to room temperature.

18. The method of claim 17 wherein said method occurs after an ion exchange procedure occurs on the substrate comprising lithium niobate.

19. A lithium niobate ($LiNbO_3$) structure comprising an optically transparent portion, said optically transparent portion substantially void of free protons.

20. An optical modulator used in telecommunications systems comprising a lithium niobate ($LiNbO_3$) structure having an optically transparent portion, said optically transparent portion substantially void of free protons.

21. An optical waveguide used in telecommunications systems comprising a

lithium niobate ($LiNbO_3$) structure having an optically transparent portion, said optically transparent portion substantially void of free protons.

22. A method for annealing lithium tantalate ($LiTaO_3$) structures, the method comprising:

heating a lithium tantalate structure in a sealed oxygen gas (O_2) atmosphere to a temperature within a range of about 150 degrees Celsius to about 1000 degrees Celsius;

pressurizing the sealed oxygen gas atmosphere to exceed ambient atmospheric pressure;

maintaining temperature and pressure for an anneal period; and

cooling to room temperature.

23. A method for annealing lithium niolate and/or lithium tantalate structures, said method comprising:

placing the structure in a vessel;

pressurizing the vessel with a gas;

heating the structure to a temperature in a range of about 150°C to about 1000°C;

maintaining the structure at said temperature for an anneal period;

cooling the structure to ambient temperature.

24. A method according to claim 23 wherein said gas comprises oxygen.

25. A method according to claim 23 wherein said gas consists essentially of oxygen.

26. An electrode/insulation structure comprising:

a layer of silicon nitride;

a gold electrode deposited directly thereon.

add A7

add B2

add C10